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Beech Trees. The Arboretum is fortunate in having in its collection eight of the ten species of Beech-trees which have been discovered up to the present time and are recognized by botanists. They are *Fagus grandifolia* of eastern North America, *F. ferruginea* of Europe, *F. orientalis* of southwestern Asia, *F. longipetiolata*, *F. Engleriana* and *F. lucida* of western China, and *F. Sieboldii* and *F. japonica* of Japan.

Fagus grandifolia differs from the other species so far as they are known here in the habit of sometimes producing stems from the roots; these often grow into small trees which form dense thickets round the parent trunk. The bark of all the species is smooth and pale, but that of the American tree is paler, a least, than that of the European tree, and the pale blue-gray bark of the stems and large branches make this tree in winter one of the most beautiful inhabitants of the forests of eastern North America. The American Beech is a common tree from eastern Canada to Florida and eastern Texas, and to Minnesota and Oklahoma. At the north it grows on uplands and mountain slopes, and often forms pure forests of considerable extent; southward the Beech varies from the northern tree in its thicker, less coarsely toothed leaves, and in the shorter and less crowded prickles on the fruit (var. *caroliniana*), and often grows on the bottom lands of streams or the borders of swamps. At the north the Beech is rarely more than seventy or eighty feet tall, but at the south it is taller and in the Mississippi valley on the rich loess of northern Louisiana and western Mississippi it is often a magnificent tree a hundred and twenty feet high with a tall trunk from three to four feet in diameter, and a fit associate of the great evergreen Magnolia (*M. grandiflora*) which also grows in this soil to its greatest size. Planted by itself in the open ground the American Beech does not grow well, and rarely makes a handsome specimen, but does best when many trees are planted so close together that the lower branches are killed and tall trunks formed.

Fagus sylvatica, the European species, is distributed over a large part of Europe except in the extreme north, growing to great perfection in England, Denmark, parts of Germany, and on the mountains of the Balkan Peninsula, often forming pure forests and growing to a height of more than a hundred feet. It is a hardy and handsome tree in New England, where it seems to be perfectly at home, and grows faster and makes a handsomer specimen tree than the American species. There is no record, unfortunately, of the date of the introduction of this tree into the United States, but judging by the size of some of the trees here it must have been at least a hundred years ago. The finest European Beeches in the neighborhood of Boston are on Longwood Mall, a strip of turf extending east from Kent Street and between Chatham and Beech Streets in Brookline. This Mall was laid out by David Sears at the time he was engaged in developing his Longwood property seventy-five or eighty years ago, and it is probable that these Beech-trees were planted at about that time. There are sixteen of these trees, thirteen with green leaves and three of the purple-leaved variety. They are all in good health and are short-stemmed specimens from sixty to seventy feet tall with wide-spreading branches which on some of the trees sweep the ground. These trees now belong to the Town of Brookline, to which Longwood Mall and three other squares in the Longwood district were left by Mr. Sears. Several varieties of the European Beech have been found in Europe and are propagated and sold by nurserymen. The best known of these varieties is the so-called Purple Beech with leaves which are pale red in spring and deep red-purple at maturity. The Purple Beech was found growing naturally in the forest in three or four places in central Europe, and the first account of it was published as long ago as 1680. Seedlings of the Purple Beech sometimes have purple leaves; such seedlings often differ in shades of color, and to some of these trees names have been given. The Purple Beech is better known and more generally planted in this country than the typical green-leafed form, and for many years now has been a favorite with tree-planters in the northeastern states. The Copper Beech (var. *cuprea*) which is probably a seedling of the Purple Beech, has paler copper red leaves than those of that tree. An interesting form (var. *pendula*) of the European Beech is a comparatively low tree with horizontal or slightly pendulous branches from which hang almost vertically the secondary branches, the whole forming a tent-like head almost as broad as high. This tree was at one time somewhat planted in this country, and the largest specimen known here is the tree growing on what was once part of the Parsons Nursery in Flushing, Long Island. This tree is said to be one of the finest specimens in existence. A picture of it can be found in Wilson's *Romance of Our Trees*. There are other forms of the European Beech with pendulous branches differing somewhat in habit from the var. *pendula* to which names have been given (vars. *bornyensis*, *remillyen-*

sis, *pagnyensis*, *miltonensis*, etc.) The Fern-leaf Beech (var. *heterophylla*) is distinguished by its variously shaped leaves, which on the same branch are long and narrow, and usually more or less deeply lobed, pinnate or laciniate. Various names (vars. *asplenifolia*, *incisa*, *laciniata*, *salicifolia* and *comptoniaefolia*) have been given to forms of this variety, but the variation is often so slight that it seems wise to call all the forms of the European Beech with cut or laciniate leaves var. *heterophylla*. The largest specimen of this tree in the United States grows on Bellevue Avenue in Newport, Rhode Island, on the grounds of the Redwood Library and Reading Room. A form of the European Beech (var. *fastigiata*) on which all the branches grow erect and form a narrow pyramidal head promises to be a handsome and useful addition to the trees with this habit, like the fastigiate Red and Sugar Maples, the fastigiate European Oak and the fastigiate Tulip-tree, European Hornbeam, etc. The original fastigiate Beech is growing at Dawyck in Peeblesshire, Scotland, and is a comparatively recent addition to the Arboretum collection. In the variety *rotundifolia* of the European Beech we have a handsome tree, probably always of small size, with nearly round leaves closely set on the branches and usually not more than an inch in diameter, a good tree to plant where there is not room for the large-growing Beech-trees. The least attractive of all the forms of the European Beech, the var. *cristata*, is a tall narrow tree with short-stemmed leaves, deeply lobed and more or less contorted, interesting as a monstrous form but of no value among ornamental trees.

Fagus orientalis is a native of southwestern Asia where it is distributed from Asia Minor to northern Persia. From the European Beech it differs chiefly in the lower prickles of the fruit which are changed into oblong linear lobes. The plants which have been grown in the Arboretum for eight years have not suffered from cold or heat, but are still too young to give an idea of the value of this tree in the United States.

Chinese Beech-trees. These do not occur north of the central provinces where three species have now been found, *Fagus longipetiolata*, *F. Engleriana*, and *F. lucida*. The first Wilson found to be the common Beech of central and western China, where it grows with Oaks, Maples and other deciduous leafed trees. This Beech is usually a small tree fifty or sixty feet tall, but in western Szech'uan, where Wilson saw the largest specimens, it is a stately and handsome tree with a single trunk rarely divided near the base and covered with very pale gray bark. *Fagus Engleriana* is common on the high mountains of northwestern Hupeh and eastern Szech'uan where it often forms pure forests. Wilson found that the trunk of this tree almost invariably divides at the base into several diverging stems which do not attain much thickness or any great height, the tallest of which there is a record being not over seventy feet high, trees of half that height or less being more common. *Fagus lucida* is distinguished from the other Chinese species by the duller gray bark of the trunk which does not separate at the base and by its thick and spreading branches which form a broad flattened or somewhat rounded head. It is a tree sometimes seventy-five feet tall, with a trunk up to three feet in diameter. This tree is common in some parts of Hupeh and Schez'uan in mixed woods, and with *F. Engleriana* sometimes makes pure forests. The young plants of these three Chinese Beeches brought by Wilson to the Arboretum in March, 1911, have been growing in the open ground since their arrival. As they have in these ten years experienced the two severest winters of which there is a Massachusetts record, it is fair to suppose that they are hardy, although only time can show if they are capable of growing here into large and healthy trees.

The Japanese Beeeh-trees are better known in the Arboretum, as *Fagus Sieboldii* was first raised here in 1893 from seed brought from Japan by Professor Sargent, and *F. japonica* was raised here only a few years later. The former is one of the great trees of Japan, often growing to the height of ninety feet and forming a trunk three feet in diameter. It is perhaps the commonest deciduous-leafed tree on the mountains of Hondo, where at altitudes between three and four thousand feet toward the upper limits of deciduous-leafed trees it forms nearly pure forests, or is mixed with Oaks and Chestnuts, and occasionally with Firs and Spruces. Northward, as on the shores of Volcano Bay in Hokkaido, it grows at sea-level, but southward it is found only on mountain slopes. *Fagus Sieboldii* has proved to be perfectly hardy in the Arboretum where it makes a handsome tree with pale bark; it has not yet produced fruit here. *Fagus japonica,* which grows on the mountains of central Hondo up to altitudes of five thousand feet, is much less abundant and less widely distributed than *F. Sieboldii.* It is a small tree with a trunk dividing near the ground into two or three large stems. This tree is growing well in the Arboretum. The plants, however, are still small with stems which do not yet show a tendency to divide.

In the Arboretum collection are now established *Fagus grandifolia* and its southern variety *caroliniana, F. sylvatica* and its varieties *macrophylla* (*latifolia*), *purpurea, purpurea f. pendula, heterophylla, pendula, remillyensis, fastigiata* (*dawyckii*), *rotundifolia, grandidentata, zlatia* and *cristata, F. orientalis F. longipetiolata, F. Engleriana* and *F. lucida, F. Sieboldii* and *F. japonica.* The two Beech-trees not in the Arboretum and not yet introduced into cultivation are *Fagus Hyatae,* which is known to grow only on a single mountain in the Head Hunters country of Formosa which Wilson could not visit when he explored that island, and *F. multinervis* confined to Dagelet Island, a small isolated island in the Japan Sea fifty miles from the east coast of central Korea. The seedling plants collected by Wilson during his visit to Dagelet in June, 1917, died before they reached the Arboretum.

Several interesting forms of the European Beech have not been planted in the Arboretum because there is no room for them in the space which can be devoted to the Beech Collection, and unless more room can be obtained for them the trees in this collection will never appeal to the imagination or create the enthusiasm which the Beech-trees on Longwond Mall in Brookline create—trees in which that town may well take pride.